DOCUMENT RESUME

ED 169 507 CS 004 778

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TITLE The Relation of SAT Scores to Birth Order and Number of Siblings.
PUB DATE May 79
NOTE 21p.; M.A. Thesis, Kean College of New Jersey

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Academic Aptitude; *Birth Order; *Correlation; Educational Research; Family (Sociological Unit); *Family Environment; High School Students; Individual Characteristics; Scores; Secondary Education; Seniors; *Verbal Ability; Verbal Tests
IDENTIFIERS *Family Size; Scholastic Aptitude Test

ABSTRACT

The purpose of this study was to determine if verbal scores on the "Scholastic Aptitude Test" (SAT) were related to student birth order and number of siblings in the family. The SAT scores of 71 randomly chosen students of the 1978 graduating class of a suburban high school were classified by family size and class rank of student. Each group of scores was then compared to the other groups to determine the relationship of the SAT score to family size and birth order. The results appear to support the hypothesis that there is no significant difference in the SAT scores across the groups. These findings would seem to indicate that hope for higher SAT scores by 1980 due to decreases in family size is unwarranted. (Author/RL)

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THE RELATION OF SAT SCORES TO BIRTH ORDER AND NUMBER OF SIBLINGS

by

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Presented to

Kean College of New Jersey

In Partial Fulfillment of the
Requirements for the Degree of
Master of Arts

May, 1979

CS004770

ABSTRACT

The purpose of this study was to determine if the intellectuality of a student, as measured by the verbal score of the Scholastic Aptitude Test, was related to the student's birth order and number of siblings in the family. The SAT scores of randomly chosen students of the 1978 graduating class of a suburban high school were classified by family size and rank of student. Each group of scores was then compared to the other groups to determine the significance of the SAT score on family size and birth order.

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INTRODUCTION

Scholastic Aptitude Test scores of high-school seniors have steadily declined over the past twelve years. The cause of the downward trend has been attributed to a variety of causes such as poor teaching, crowded classrooms, a lack of intellectual interest on the part of the students, and because more poor and minority students are taking the test. The SAT test itself has been attacked as a poor measure of scholarship potential.

Robert B. Zajonc (1975) of the University of Michigan has proposed another explanation for the lowering of scores which has attracted the attention of many educators and parents. Zajonc and colleague Gregory Markus allow that, setting aside the influence of heredity, quality of education, and type of child rearing, intelligence can also be influenced by the number of siblings in the family, and birth order in the family. After many years of study, they have concluded that "Intelligence declines with family size; the fewer children in your family, the smarter you are likely to be. Intelligence also declines with birth order; the fewer older brothers and sisters you have, the brighter you are likely to be."

What evidence is there to support the decline in intellectual ability in relation to birth order and family size? Zajonc's research offers the explanation that the first-born child is intellectually influenced by his parents, while younger siblings of a family are more likely to receive stimulation from the less mature minds of older brothers and

sisters. Zajonc and Markus devised a mathematical formula to "estimate the intellect of a child at any given time, and to describe the intellectual level of any given family." Their research indicates, through the use of the formula, how each successive child of a family enters an environment of less intelligence.

Hunter M. Breland (1973), a psychologist who studied 800,000 participants in the National Merit Scholarship Qualification Test, found average scores tended to show a decline as family size increased. Zajonc refers to three studies in his research which arrived at similar results. These were done on large populations in France, Scotland, and the Netherlands.

Another variable which seems to affect the child's intellect, and which should be considered in relation to Zajonc's hypothesis, is the spacing between the birth of the children. Longer gaps between births give the older child more time as a member of a small family which is beneficial to his intellectual growth. The younger child also benefits because his sibling has grown older and developed intellectually, thereby adding to the general intellectual atmosphere of the family. The validity of the variable is supported by psychologist R.G. Record, as related in a report by Carol Tarvis (1976). Record's findings revealed that twins received lower scores on IQ tests than nontwins. Also, the average verbal reasoning score on the National Merit Scholarship was lower for triplets than for twins.

The only child would appear to be the flaw in Zajonc's theory. According to the formula, only children should be the highest scorers since they are first-born. On the contrary, the average score of only children was similar to those of first-borns in a family of four. Zajonc's explanation is that the only child is last-born as well as first-born. They have no younger siblings to teach whereby their own understanding can be fixed.

HYPOTHESIS

For the purpose of contributing evidence to this topic, a study was conducted to determine if SAT scores were indeed affected by birth order and family size. It was hypothesized that the intellectuality of a student as measured by Scholastic Aptitude Test scores would not be significantly different from his sibling when compared according to birth order and number of siblings in the family.

DEFINITIONS

Intellectuality - scores indicating average or above-average performance on the SAT.

Birth order - the rank of the student in relation to the children in the family.

Siblings - brothers and sisters in student's immediate family.

ASSUMPTIONS

The researcher assumes the score achieved by the student on the SAT to be valid and reliable for the purpose of this study. It is also assumed that the subjects were willing, and performed to the best of their ability on the SAT. A further assumption is that the student's record, from which SAT scores were copied, was current and correctly listed. The response to the questionnaire is assumed to be accurate.

LIMITATIONS

The brief period of time available for this study will necessarily limit the extent of the study. The SAT scores from one graduating class will be considered. The study will be limited to the number of permission responses received from 118 requests. The many other factors which influence SAT scores will not be examined or discussed.

PROCEDURES

It was determined that the information for the study would be obtained from randomly chosen members of the 1978 graduating class of Westfield High School, Westfield, New Jersey.

Each name on the graduation list was numbered. The honor group was included with the regular graduates so that alphabetical order was not retained. A computer print-out provided the one-hundred twenty random numbers requested. Each random

number was matched with the same number on the graduation list. The names of the subjects were then checked against a list of students who had Scholastic Achievement Test (SAT) scores. The subjects without SAT scores were discarded and additional random numbers requested of the computer and the above-mentioned procedure followed. A sample of 118 subjects was chosen for the study.

Each subject was sent a letter of request to which a brief, closed-form questionnaire was attached. (A copy of the letter is included in Appendix A.) The three questions asked for permission to use the SAT score, the subject's rank in the family, and the number of children in the family. These were mailed to the subject with an enclosed stamped envelope addressed to the researcher.

RESULTS

Seventy-one returns were realized of the one hundred and eighteen requests for use of SAT scores sent to randomly selected 1978 graduates of Westfield High School.

The scores were classified by family size and rank of the student. Each group of scores was then compared to the other groups to determine the significance of the SAT scores on family size and birth order. The results of the comparison appear in Tables I to X.

None of the groups compared showed a significant difference between their mean achievements. The comparison of the SAT scores of the first-born with that of the fourth-born

came closest to being significant with a t of 1.87. The scores of the second of two children compared with those of the second of three children followed closely with a t of 1.80. Finally, the comparison of the scores of the third of three children with the second of four children resulted in a t of 1.71. All other t-tests ranged below this point except one. The one t, a -1.78, indicated that the last-born in a family of four had better SAT scores than the second of four children; but, again, the difference was not significant.

CONCLUSIONS AND IMPLICATIONS

The results appear to support the hypothesis that there is no significant difference in the SAT scores of samples when analyzed according to family size as determined by a study of randomly selected students of the 1978 graduating class of Westfield High School in Westfield, New Jersey.

The findings would seem to indicate that optimism over the rise of SAT scores by 1980 due to decreases in family size is unwarranted. However, the researcher feels the implication is also present for further testing on a larger sample, and one chosen from a wider socially stratified community than Westfield, New Jersey.

TABLE I

COMPARING SAT RESULTS OF ONLY CHILDREN WITH THOSE FROM DIFFERENT-SIZED FAMILIES

RANK	MEAN	STANDARD DEVIATION	t-TEST
Only child	505	35	.055
1st of 2 children	495	237	
Only child	505	35	.498
2nd of 2 children	550	111	
Only child	505	35	.081
1st of 3 children	494	112	
Only child	505	35	.663
2nd of 3 children	450	107	
Only child	505	35	-.148
3rd of 3 children	513	68	
Only child	505	35	-.585
1st of 4 children	540	59	
Only child	505	35	1.260
2nd of 4 children	433	56	
Only child	505	35	.237
3rd of 4 children	483	97	
Only Child	505	35	-.517
4th of 4 children	527	37	
Only child	505	35	.920
5th of 5 children	463	41	

TABLE II

COMPARING SAT RESULTS OF THE FIRST OF TWO CHILDREN WITH THOSE OF DIFFERENT-SIZED FAMILIES

RANK	MEAN	STANDARD DEVIATION	t-TEST
1st of 2 children	495	237	.551
2nd of 2 children	550	111	
1st of 2 children	495	237	.009
1st of 3 children	494	112	
1st of 2 children	495	237	.557
2nd of 3 children	450	107	
1st of 2 children	495	237	-.223
3rd of 3 children	513	68	
1st of 2 children	495	237	-.306
1st of 4 children	540	59	
1st of 2 children	495	237	.422
2nd of 4 children	433	56	
1st of 2 children	495	237	.080
3rd of 4 children	483	97	
1st of 2 children	495	237	-.219
4th of 4 children	527	37	
1st of 2 children	495	237	.218
5th of 5 children	463	41	

TABLE III

COMPARING SAT RESULTS OF THE SECOND OF TWO CHILDREN FAMILIES WITH THOSE OF DIFFERENT-SIZED FAMILIES

RANK	MEAN	STANDARD DEVIATION	t-TEST
2nd of 2 children	550	111	.785
1st of 3 children	494	112	
2nd of 2 children	550	111	1.800
2nd of 3 children	450	107	
2nd of 2 children	550	111	.800
3rd of 3 children	513	68	
2nd of 2 children	550	111	.131
1st of 4 children	540	59	
2nd of 2 children	550	111	1.550
2nd of 4 children	433	56	
2nd of 2 children	550	111	.810
3rd of 4 children	483	97	
2nd of 2 children	550	111	.313
4th of 4 children	527	37	
2nd of 2 children	550	111	1.180
5th of 5 children	463	41	

TABLE IV

COMPARING SAT RESULTS OF THE FIRST OF THREE CHILDREN WITH THOSE OF DIFFERENT-SIZED FAMILIES

RANK	MEAN	STANDARD DEVIATION	t-TEST
1st of 3 children	494	112	.330
2nd of 3 children	450	107	
1st of 3 children	494	112	-.142
3rd of 3 children	573	68	
1st of 3 children	494	112	-.180
1st of 4 children	540	59	
1st of 3 children	494	112	.239
2nd of 4 children	433	56	
1st of 3 children	494	112	.043
3rd of 4 children	483	97	
1st of 3 children	494	112	-.130
4th of 4 children	527	37	
1st of 3 children	494	112	.122
5th of 5 children	463	41	

TABLE V

COMPARING SAT RESULTS OF THE SECOND OF THREE CHILDREN WITH THOSE OF DIFFERENT-SIZED FAMILIES

RANK	MEAN	STANDARD DEVIATION	t-TEST
2nd of 3 children	450	107	-1.520
3rd of 3 children	513	68	
2nd of 3 children	450	107	-1.300
1st of 4 children	540	59	
2nd of 3 children	450	107	.246
2nd of 4 children	433	56	
2nd of 3 children	450	107	-.447
3rd of 4 children	483	97	
2nd of 3 children	450	107	-1.140
4th of 4 children	527	37	
2nd of 3 children	450	107	-.191
5th of 5 children	463	41	

TABLE VI

COMPARING SAT RESULTS OF THE THIRD OF THREE CHILDREN WITH THOSE OF DIFFERENT-SIZED FAMILIES

RANK	MEAN	STANDARD DEVIATION	t-TEST
3rd of 3 children	513	68	-.573
1st of 4 children	540	59	
3rd of 3 children	513	68	1.710
2nd of 4 children	433	56	
3rd of 3 children	513	68	.570
3rd of 4 children	483	97	
3rd of 3 children	513	68	-.315
4th of 4 children	527	37	
3rd of 3 children	513	68	1.120
5th of 5 children	463	41	

TABLE VII

COMPARING SAT RESULTS OF THE FIRST OF FOUR CHILDREN WITH THOSE OF DIFFERENT-SIZED FAMILIES

RANK	MEAN	STANDARD DEVIATION	t-TEST
1st of 4 children	540	59	1.870
2nd of 4 children	433	56	
1st of 4 children	540	59	.709
3rd of 4 children	483	97	
1st of 4 children	540	59	.265
4th of 4 children	527	37	
1st of 4 children	540	59	1.520
5th of 5 children	463	41	

TABLE VIII

COMPARING SAT RESULTS OF THE SECOND OF FOUR CHILDREN WITH THOSE OF DIFFERENT-SIZED FAMILIES

RANK	MEAN	STANDARD DEVIATION	t-TEST
2nd of 4 children	433	56	-.667
3rd of 4 children	483	97	
2nd of 4 children	433	56	-1.780
4th of 4 children	527	37	
2nd of 4 children	433	56	-.614
5th of 5 children	463	41	

TABLE IX

COMPARING SAT RESULTS OF THE THIRD OF FOUR CHILDREN WITH THOSE OF DIFFERENT-SIZED FAMILIES

RANK	MEAN	STANDARD DEVIATION	t-TEST
3rd of 4 children	483	97	-.598
4th of 4 children	527	37	
3rd of 4 children	483	97	.268
5th of 5 children	463	41	

TABLE X

COMPARING SAT RESULTS OF THE FOURTH OF FOUR CHILDREN WITH THE FIFTH OF FIVE CHILDREN

RANK	MEAN	STANDARD DEVIATION	t-TEST
4th of 4 children	527	37	1.640
5th of 5 children	463	41	

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